

**Listing of the Claims:**

Claims 1-35. (cancelled)

36. (New) A method of monitoring renal tubular epithelial differentiation comprising:
- a) isolating at least one cell
  - b) placing said cell into a rotating wall vessel containing a cell culture comprising culture media and culture matrix; and
  - c) monitoring expression of greater than one gene in an array, wherein the said expression of said genes is indicative of differentiated renal tubular epithelial cells.
37. (Currently Amended) The method of claim ~~27~~ 36, wherein each gene in said genes is selected from the group consisting of 1- $\alpha$ -hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1 $\beta$ , a GABA transporter gene,  $\beta$  actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and  $\gamma$ -glutamyl transferase.
38. (New) The method of claim ~~27~~ 36, wherein said expression of [a] said genes is increased.
39. (New) The method of claim ~~29~~ 38, wherein each gene in said genes is selected from the group consisting of 1- $\alpha$ -hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1 $\beta$ , a GABA transporter gene,  $\beta$  actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and  $\gamma$ -glutamyl transferase.
40. (New) The method of claim ~~27~~ 36, wherein said expression of [a] said genes is decreased.
41. (New) The method of claim ~~34~~ 40, wherein each gene in said genes is selected from the group consisting of 1- $\alpha$ -hydroxylase, megalin, cubulin, erythropoietin, manganese super oxide dysmutase, interleukin-1 $\beta$ , a GABA transporter gene,  $\beta$  actin, villin, extracellular calcium sensing receptor, ICAM, VCAM, and  $\gamma$ -glutamyl transferase.
42. (New) A method of producing active renal epithelial cells comprising:
- a) isolating renal stem cells; and
  - b) culturing said cells in a rotating wall vessel containing a cell culture comprising culture media and culture matrix, wherein gravity is substantially balanced in said rotating wall vessel by equal and opposite physical forces comprising shear-stresses.

43. (New) The method of claim 34 wherein shear-stress response is reduced by the addition of a transcription factor decoy oligonucleotide encoding a shear-stress response element specific sequence.
44. (New) A method of producing active 1,25-dihydroxy vitamin D3 comprising:
- a) isolating at least one cell;
  - b) placing said cell into a rotating wall vessel containing a cell culture comprising culture media and culture matrix; and
  - c) inducing 1,25-dihydroxy vitamin D3 production.